



# **Program of ICoEV 2017**

## **International Conference on Engineering Vibration**

Sofia, 4-7 September 2017

**The Organizing committee of ICoEV 2017 would like to acknowledge the financial support through the Bulgarian NSF Grant DPMNF 01/20 - 13.06.2017.**

## Foreword

### Dear Colleagues,

It is our great pleasure and privilege to welcome you to the International Conference on Engineering Vibration (ICoEV-2017) held in Sofia, Bulgaria between 4 and 7 September 2017.

The International Conference of Engineering Vibration (ICoEV) originates from a long-running series called the International Conference of Vibrational Problems (ICoVP), which was founded in India over 20 years. The last conference organised in Ljubljana in 2015, was renamed as International Conference of Engineering Vibration (ICoEV). The ICoEV-2015 has attracted some 250 participants from around the world including senior scientists, PhD students and practising vibration engineering.

The Steering and Organising Committees of the conference have made great efforts to maintain the high scientific standard of the papers. The conference is based on two full days and two half days of technical presentations, structured into four parallel sessions. On each day of the conference there will be an invited lecture in the morning but on Monday and Tuesday the afternoon sessions will start again with invited lectures. The presentations are organized into 16 mini-symposia and one other with general topic.

The social programme includes a welcome reception at hotel Hilton on Monday, which is free for everybody, a Wednesday afternoon guided city tour of Sofia including a visit of the National History Museum and the conference dinner on Wednesday for the registered participants with full registration fee. The program for the registered accompanying persons includes additionally one-day tour to Rila Monastery, including entrance in the museum and lunch in the area on 5th September 2017 (Tuesday).

The ICoEV-17 conference venue, Hotel Hilton is located at the heart of the Bulgarian capital Sofia. It is surrounded by the city's South Park, opposite the National Palace of Culture and overlooking the Vitosha Mountain, and it is situated in the centre of Sofia City and is in walking distance from most of the historical and cultural places.

We express our gratitude to the Secretary of the Organizing Committee, Assoc. Prof. Stanislav Stoykov who has done an excellent job in making this conference a reality. Further thanks also go to the members of both the Scientific and Steering Committees, to our six invited speakers, to the organisers of the mini-symposia, to the National Research Fund who supported the event and to all the contributing authors.

On behalf of the Steering and Organizing Committees we sincerely hope that you will all enjoy your time in Sofia during our conference.

Prof. Emil Manoach  
Chair of the Organizing Committee  
Bulgarian Academy of Sciences  
Bulgaria

Prof. Marian Wiercigroch  
Chair of the Steering Committee  
University of Aberdeen,  
UK



## **Organizing Committee**

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Institute of Mechanics  
Bulgarian Academy of Sciences  
Bulgaria

**Stanislav Stoykov**

Institute of Information and Communication Technologies  
Bulgarian Academy of Sciences  
Bulgaria

**Stefan Karastanev**

Institute of Mechanics  
Bulgarian Academy of Sciences  
Bulgaria



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**Miha Boltežar**, University of Ljubljana, Faculty of Mechanical Engineering, Slovenia

**Janko Slavič**, University of Ljubljana, Faculty of Mechanical Engineering, Slovenia

**Emil Manoach**, Institute of Mechanics, Bulgarian Academy of Sciences, Bulgaria

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**Jerzy Warminski**, Lublin University of Technology, Poland

**Hans Weber**, Pontifical Catholic University of Rio de Janeiro, Brazil

**Marian Wiercigroch**, University of Aberdeen, UK



## Mini Symposia

### MS 01. Mitigation of Vibrations of Mechanical and Structural Systems

**Przemyslaw Perlikowski**, Lodz University of Technology, Lodz Poland, e-mail:

[przemyslaw.perlikowski@p.lodz.pl](mailto:przemyslaw.perlikowski@p.lodz.pl)

**Daniil Yurchenko**, School of Engineering & Physical Sciences; Mechanical Engineering Heriot-Watt University, Edinburgh, UK, e-mail: [d.yurchenko@hw.ac.uk](mailto:d.yurchenko@hw.ac.uk)

### MS 02. Nonlinear Oscillations and Controls of Mechanical, Civil, Aerospace and Naval Structures

**Jose M. Balthazar**, Aeronautical Institute of Technology, Brazil, e-mail:

[jmbaltha@gmail.com](mailto:jmbaltha@gmail.com)

**Paulo Batista Goncalves**, Pontifical Catholic Univ Rio de Janeiro, Brazil. e-mail:

[paulo@puc-rio.br](mailto:paulo@puc-rio.br)

**Elżbieta Jarzębowska**, Warsaw Institute of Technology, Poland, e-mail:

[elajarz@meil.pw.edu.pl](mailto:elajarz@meil.pw.edu.pl)

### MS 03. Modelling, Methodologies and Engineering Applications of Nonlinear Dynamical Systems

**Qingjie Cao**, Harbin Institute of Technology, Harbin, China; e-mail: [Q.J.Cao@hit.edu.cn](mailto:Q.J.Cao@hit.edu.cn)

**Marian Wiercigroch**, University of Aberdeen, UK; e-mail: [m.wiercigroch@abdn.ac.uk](mailto:m.wiercigroch@abdn.ac.uk)

**Li-Qun Chen**, Shanghai University, China; e-mail: [lqchen@staff.shu.edu.cn](mailto:lqchen@staff.shu.edu.cn)

### MS 04. Vibration of Solids and Structures under Moving Loads: Modelling and Analysis

**Piotr Koziol**, Chair of Rail & Air Transport Infrastructure, Cracow University of Technology, Kraków, Poland e-mails: [pkoziol@pk.edu.pl](mailto:pkoziol@pk.edu.pl)

**Zuzana Dimitrovová**, Department of Civil Engineering, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa and LAETA, IDMEC, Instituto Superior Técnico, Universidade de Lisboa, Lisbon, Portugal e-mail: [zdim@fct.unl.pt](mailto:zdim@fct.unl.pt)

### MS 05. Dynamics of Composite and Smart Structures

**Jerzy Warminski**, Department of Applied Mechanics, Lublin University of Technology, Poland, e-mail: [j.warminski@pollub.pl](mailto:j.warminski@pollub.pl)

**Stefano Lenci**, Department of Civil and Building Engineering, and Architecture, Polytechnic University of Marche, Ancona, Italy, e-mail: [lenci@univpm.it](mailto:lenci@univpm.it)

**Krzysztof Marynowski**, Division of Dynamics, Łódź University of Technology, Łódź, Poland, e-mail: [krzysztof.marynowski@p.lodz.pl](mailto:krzysztof.marynowski@p.lodz.pl)

### MS 06. Nonlinear Dynamics of MEMS & NEMS

**Najib Kacem**, University of Franche-Comté / FEMTO-ST Institute, France; email:

[najib.kacem@femto-st.fr](mailto:najib.kacem@femto-st.fr)

**Fehmi Najar**, Ecole Polytechnique de Tunisie, Tunisia, e-mail: [fehmi.najar@gmail.com](mailto:fehmi.najar@gmail.com)

**MS 07. Vibration of Beams, Plates and Shells, from Nano to Macro**

**Pedro Ribeiro**, Faculdade de Engenharia da Univ do Porto, Portugal, e-mail:

[pmleal@fe.up.pt](mailto:pmleal@fe.up.pt)

**Paulo Gonçalves**, Pontifical Catholic Univ Rio de Janeiro, Brazil, e-mail: [paulo@puc-rio.br](mailto:paulo@puc-rio.br)

**Olivier Thomas**, Arts et Métiers Paris Tech, France, e-mail: [Olivier.THOMAS@ensam.eu](mailto:Olivier.THOMAS@ensam.eu)

**MS 08. Nonlinearity and Stochasticity in Vibrating Systems**

**Sayan Gupta**, Indian Institute of Technology Madras, Chennai, India, e-mail:

[sayan@iitm.ac.in](mailto:sayan@iitm.ac.in)

**Przemyslaw Perlikowski**, Lodz University of Technology, Poland, e-mail:

[przemyslaw.perlikowski@p.lodz.pl](mailto:przemyslaw.perlikowski@p.lodz.pl)

**MS 09. Vibration in Mechanical and Biomechanical Systems**

**Rafal Rusinek**, Lublin University of Technology, Lublin, Poland, e-mail:

[r.rusinek@pollub.pl](mailto:r.rusinek@pollub.pl)

**MS 10. Modelling of Friction and Dynamics of Frictional Oscillators**

**Andrzej Stefański**, Lodz University of Technology, Lodz, Poland. e-mail:

[steve@p.lodz.pl](mailto:steve@p.lodz.pl)

**Yang Liu**, University of Exeter, Exeter, United Kingdom. e-mail: [y.liu2@exeter.ac.uk](mailto:y.liu2@exeter.ac.uk)

**MS 11. Active Vibration Control**

**Maryam Ghandchi Tehrani**, Institute of Sound and Vibration Research, University of Southampton, Southampton, UK, e-mail: [m.ghandchi-tehrani@soton.ac.uk](mailto:m.ghandchi-tehrani@soton.ac.uk)

**Bram Cornelis**, Siemens Industry Software NV, Leuven, Belgium, e-mail:

[bram.cornelis@siemens.com](mailto:bram.cornelis@siemens.com)

*This mini-symposium is organized as an industrial workshop in the frame of the FP7 Marie Curie ANTARES ITN project, which focuses on the development of energy efficient mechatronic solutions through advanced active noise and vibration control strategies.*

**MS 12. Nonlinear Effects in Broadband Energy Harvesting from Mechanical Vibrations**

**Grzegorz Litak**, Lublin University of Technology and AGH University of Science and Technology in Krakow, Poland, e-mail: [g.litak@pollub.pl](mailto:g.litak@pollub.pl)

**Benjamin Ducharne**, Laboratoire de Génie Electrique et Ferroélectricité, Institut National des Sciences Appliquées de Lyon, France, e-mail: [benjamin.ducharne@insa-lyon.fr](mailto:benjamin.ducharne@insa-lyon.fr)

**MS 13. New Trends in Analytical Approaches to Nonlinear Vibration**

**Nicolae Herisanu**, Universitatea Politehnica din Timisoara, Timisoara, Romania, e-mail:

[nicolae.herisanu@upt.ro](mailto:nicolae.herisanu@upt.ro)

**MS 14. Vibration-Based Structural Health Monitoring Data Analysis and Time Series Methods**

**Irina Trendafilova**, University of Strathclyde, Glasgow, Department of Mechanical and Aerospace Engineering, e-mail: [irina.trendafilova@strath.ac.uk](mailto:irina.trendafilova@strath.ac.uk)

**David Garcia**, University of Strathclyde, Glasgow, Department of Mechanical and Aerospace Engineering, e-mail: [david.garcia@strath.ac.uk](mailto:david.garcia@strath.ac.uk)

**MS 15. Wave Mechanics: Generation and Propagation of Waves in Fluids, Solids and Structures**

**Apostolos Tsouvalas**, Department of Hydraulic Engineering, Delft University of Technology, The Netherlands, e-mail: [a.tsouvalas@tudelft.nl](mailto:a.tsouvalas@tudelft.nl)

**Andrei V. Metrikine**, Departments of Structural and Hydraulic Engineering, Delft University of Technology, The Netherlands, e-mail: [a.metrikine@tudelft.nl](mailto:a.metrikine@tudelft.nl)

**MS 16. Vibration and Control in Downhole Drilling Processes**

**Marian Wiercigroch**, Centre for Applied Dynamics Research, School of Engineering, University of Aberdeen, Scotland, UK; E-mail: [m.wiercigroch@abdn.ac.uk](mailto:m.wiercigroch@abdn.ac.uk)

**Vahid Vaziri**, Centre for Applied Dynamics Research, School of Engineering, University of Aberdeen, Scotland, UK; e-mail: [vahid.vaziri@abdn.ac.uk](mailto:vahid.vaziri@abdn.ac.uk)

**Marcin Kapitaniak**, Centre for Applied Dynamics Research, School of Engineering, University of Aberdeen, Scotland, UK; e-mail: [m.kapitaniak@abdn.ac.uk](mailto:m.kapitaniak@abdn.ac.uk)



## ICoEV 2017 PROGRAM OVERVIEW

### Sunday, 3<sup>rd</sup> September 2017

17:00 - 20:00	Registration at the lobby of hotel HILTON
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### Monday, 4<sup>th</sup> September 2017

08:00 - 09:00	Registration (lobby of Hotel Hilton)			
09:00 - 09:30	Opening Ceremony			
09:30 - 10:20	Opening Lecture: Mathew Cartmell (Strathclyde, UK)			
10:20 - 10:50	Coffee Break			
10:50 - 12:30	MS 14	MS 03	MS 12	MS 02
	MS 14	MS 03	MS 12	MS 02
	MS 14	MS 03	MS 12	MS 02
	MS 14	MS 03	MS 12	MS 02
	MS 14	MS 03	MS 12	MS 02
12:30 - 14:00	Lunch			
14:00 - 14:50	Plenary Lecture: Anindya Chatterjee (IIT Kanpur, India)			
14:50 - 15:20	Coffee Break			
15:20 - 17:00	MS 14	MS 06	MS 11	MS 10
	MS 14	MS 06	MS 11	MS 10
	MS 14	MS 06	MS 11	MS 10
	MS 14	MS 06	MS 11	MS 10
	MS 14	MS 06	MS 11	MS 10
17:00 - 17:10	Break			MS 10
17:10 - 18:50	MS 05	MS 03	MS 12	
	MS 05	MS 03	MS 12	
	MS 05	MS 03	MS 12	
			MS 12	
19:00	Welcome Reception			

## Tuesday, 5<sup>th</sup> September 2017

09:00 - 09:50	Plenary Lecture: Tomasz Kapitaniak (Lodz University of Technology)			
09:50 - 10:20	Coffee Break			
10:20 - 12:40	MS 05	MS 01	MS 11	MS 16
	MS 05	MS 01	MS 11	MS 16
	MS 05	MS 01	MS 11	MS 16
	MS 05	MS 01	MS 11	MS 16
		MS 01	MS 11	MS 16
		MS 01		
		MS 01		
12:00 - 14:00	Lunch			
14:00 - 14:50	Plenary Lecture: Marcelo Savi (Federal University of Rio de Janeiro)			
14:50 - 15:20	Coffee Break			
15:20 - 16:40	MS 07	MS 08	MS 03	MS 13
	MS 07	MS 08	MS 03	MS 13
	MS 07	MS 08	MS 03	MS 13
	MS 07	MS 08	MS 03	MS 13
16:40 - 16:50	Break			
16:50 - 18:30	MS 07	MS 04	MS 06	MS 16
	MS 07	MS 04	MS 06	MS 16
	MS 07	MS 04	MS 06	MS 16
	MS 07	MS 04	MS 06	MS 16
		MS 04	MS 06	

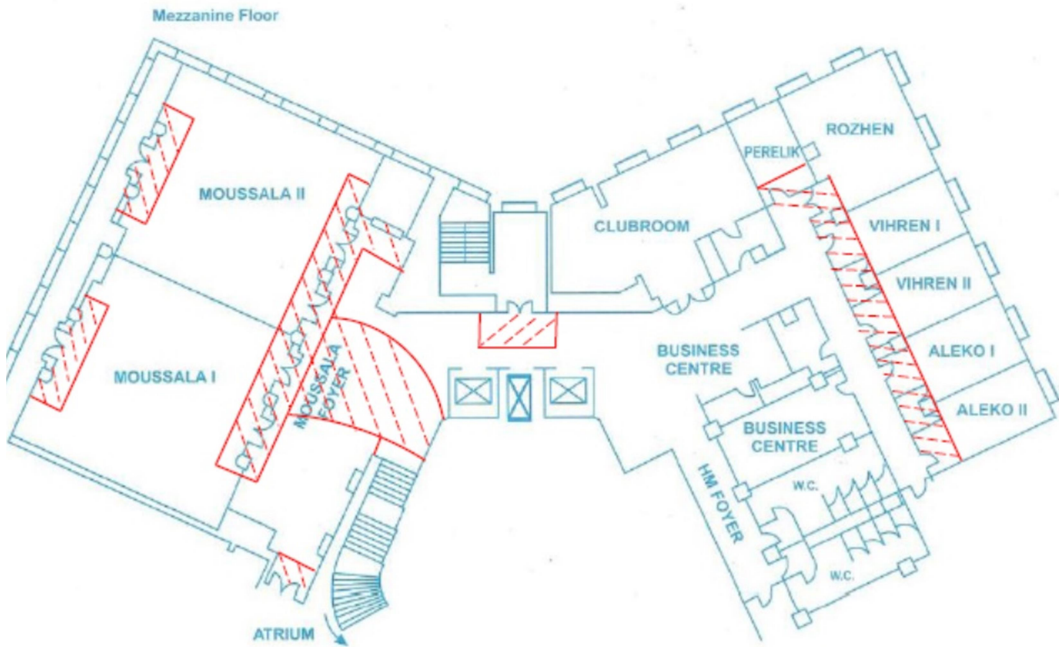
### Wednesday, 6<sup>th</sup> September 2017

09:00 - 09:50	Plenary lecture: John Mottershead (University of Liverpool, UK)			
09:50 - 10:20	Coffee Break			
10:20 - 12:00	MS 16	MS 08	MS 02	MS 15
	MS 16	MS 08	MS 02	MS 15
	MS 16	MS 08	MS 02	MS 15
	MS 16	MS 08	MS 02	MS 15
	MS 16	MS 08	MS 02	MS 15
12:00 - 12:30	Vibrations in Rotating Machinery – presentation of HBM Prenscia			
12:30 - 13:30	Lunch			
13:30 - 18:00	Excursion			
19:00	Conference Dinner			

### Thursday, 7<sup>th</sup> September 2017

09:00 - 09:50	Closing Lecture: Haiyan Hu (Beijing Institute of Technology, China)			
09:50 - 10:20	Coffee Break			
10:20 - 12:20	GEN	MS 04	MS 09	MS 15
	GEN	MS 04	MS 09	MS 15
	GEN	MS 04	MS 09	MS 15
	GEN	MS 04	MS 09	MS 15
	GEN	MS 04	MS 09	MS 15
	GEN		MS 09	
12:30 - 13:00	Closing Ceremony			
13:00 - 14:00	Lunch			

# ICoEV 2017 room map





# Technical program

Sunday, 3rd September 2017

17:00 - 20:00

Registration (Lobby of hotel Hilton)

Monday, 4<sup>th</sup> September 2017

08:00 – 09:00	Registration (Lobby of Hotel Hilton)			
09:00 – 09:30	Opening Ceremony			
09:30 – 10:20	<b>Opening Lecture: Mathew Cartmell</b> (Strathclyde, UK), Motorised momentum exchange space tethers: Modelling of the three dimensional dynamics of asymmetrical motorised tethers <b>Chair: Marian Wiercigroch</b>			
10:20 – 10:50	Coffee Break			
10:50	<b>Hall Moussala 1</b> <b>MS 14. Vibration-Based Structural Health Monitoring Data Analysis and Time Series Methods</b> <b>Chair: Irina Trendafilova</b>	<b>Hall Moussala 2</b> <b>MS 03. Modelling, Methodologies and Engineering Applications of Nonlinear Dynamical Systems</b> <b>Chair: Li-Qun Chen</b>	<b>Hall Vihren</b> <b>MS 12. Nonlinear Effects in Broadband Energy Harvesting from Mechanical Vibrations</b> <b>Chair: Grzegorz Litak</b>	<b>Hall Aleko</b> <b>MS 02. Nonlinear Oscillations and Controls of Mechanical, Civil, Aerospace and Naval Structures</b> <b>Chair: Paulo Batista Gonçalves</b>
10:50 – 11:10	Damping identification using high-speed video <b>Janko Slavič, Marko Mihalec, Jaka Javh, Miha Boltežar</b>	Fluid nonlinearities effect on wake oscillator model performance <b>Ekaterina Pavlovskaja</b>	Refined modeling of a piezo-magneto elastic energy harvesting device <b>Lukas Lentz</b>	Non-linear finite element analysis of the dynamics of a slender cable stayed tower <b>Paulo Batista Gonçalves, Eliot Pezo Zegarra, Deane Roehl</b>
11:10 – 11:30	Dynamics and vibration-based monitoring of nano-enriched structural members <b>Irina Trendafilova, Cristobal Garcia</b>	Analysis for the vibration characteristic of a rotating beam with varying section <b>Nannan Wang, Tengfei Shi, Caishan Liu</b>	On the efficiency of a bi-stable energy harvesting device driven by a random excitation <b>Americo Cunha Jr</b>	An experimental investigation for flutter suppression control of a high-aspect-ratio flexible wing model <b>Boo Cheong Khoo</b>

## Monday, 4<sup>th</sup> September 2017 (Cont.)

11:30 – 11:50	Study of singular spectrum analysis as a data-driven technique for damage diagnosis. Comparison between the time or frequency domain <b>David Garcia Cava, Irina Trendafilova</b>	Normal form analysis of stator rub in rotating machinery <b>Alexander David Shaw, Alan R Champneys, Michael Ian Friswell</b>	Electrical response of the linear and nonlinear electromagnetic energy harvester in the wide range of base acceleration amplitudes <b>Krzysztof Kucab, Grzegorz Górski</b>	Motorcycle control-oriented dynamics modeling for accelerated maneuvers on slippery terrains <b>Elżbieta Maria Jarzębowska, Michał Cieśluk</b>
11:50 – 12:10	Vibro-acoustic and nonlinear analysis of cadaveric femoral bone impaction in cavity preparations <b>Sebastian Oberst</b>	A computational study on the influence of the delayed yielding phenomenon in magnetorheological oils on the steady state vibration and forces transmitted between the rotor and its frame <b>Jaroslav Zapoměl, Petr Ferfecki, Jan Kozánek</b>	Robust design of a nonlinear electromagnetic vibration energy harvester <b>Issam Abed, Najib Kacem, Nouredine Bouhaddi</b>	Numerical solution of non-linear vibrations of a fractionally damped cylindrical shell under the conditions of combinational internal resonance <b>Basem Khalil Ajarmah</b>
12:10 – 12:30	Vibration based damage detection of 3D beams <b>Stanislav Stoykov, Emil Manoach, Maosen Cao</b>	Middle ear vibrations with SMA prosthesis – experimental research <b>Rafal Rusinek</b>	Energy harvesting from a magnetic levitation system excited by an electro-dynamical shaker <b>Rodrigo Rocha, Jose Balthazar, Angelo Tusset, Silvio Thomaz de Souza, Hassan Arbex (will be presented by Americo Cunha Jr)</b>	Jump attenuation in a nonideal system using shape memory element <b>Adriano Kossoski, Angelo Tusset, Frederic Janzen, Rodrigo Rocha, Jose Balthazar, Reyolando da Fonseca Brasil, Airton Nabarrete (will be presented by Paulo Batista Gonçalves)</b>
12:30 – 14:00	<b>Lunch</b>			
14:00 – 14:50	<b>Plenary lecture: Anindya Chatterjee (IIT Kanpur, India), A two-state hysteresis model obtained from a high-dimensional frictional system Chair: Miha Boltežar</b>			
14:50 – 15:20	<b>Coffee Break</b>			

**Monday, 4<sup>th</sup> September 2017 (Cont.)**

15:20	Hall Moussala 1 MS 14. Vibration-Based Structural Health Monitoring Data Analysis and Time Series Methods Chair: Janko Slavič	Hall Moussala 2 MS 06. Nonlinear Dynamics of MEMS & NEMS Chair: Najib Kacem	Hall Vihren MS 11. Active Vibration Control Chair: Maryam Tehrani	Hall Aleko MS 10. Modelling of Friction and Dynamics of Frictional Oscillators Chair: Andrzej Stefanski
15:20 – 15:40	Principal component analysis for bearing fault detection <i>Irina Trendafilova, Hussein Al Bugharbee</i>	Chaos prediction in nano-resonators based on nonlocal elasticity theory <i>Hassan Nahvi</i>	Active nonlinear control of a stroke limited inertial actuator <i>Mattia Dal Borgo, Maryam Ghandchi Tehrani, Stephen John Elliott</i>	Bifurcation analysis of a rigid impact oscillator with bilinear damping <i>Yang Liu</i>
15:40 – 16:00	Excitation system based on laser induced plasma to generate Lamb wave <i>Naoki Hosoya, Atsushi Yoshinaga, Atsushi Kanda, Ryosuke Umino, Itsuro Kajiwara</i>	Anharmonic oscillations in a micro beam resonator <i>Vassil Vassilev Tzanov</i>	Solving nonlinear dynamic transport control problems by using bionic optimization tools <i>Rolf Steinbuch, Lukas Haas</i>	Method of estimation of Lyapunov exponents spectrum for friction oscillators <i>Andrzej Stefański, Marek Balcerzak</i>
16:00 – 16:20	Use of damping identification technique for damage detection <i>Vikas Arora</i>	Nonlinear modeling of a piezoelectric-flexoelectric nanobeam actuator <i>Fehmi Najar, Sourour Baroudi</i>	Gear meshing induced forces in high speed planetary gear boxes <i>Daniel Fritz Plöger, Philipp Zech, Stephan Rinderknecht</i>	Comparison of responses of the friction oscillator for various friction models <i>Jerzy Wojewoda</i>
16:20 – 16:40	Bayesian approach to bilinear system identification <i>Daniil Yurchenko</i>	Dynamic analysis of squeeze film damping in MEMS micro beam using fully nonlinear coupled fluid-structure interactions <i>Sarah BenSassi, Ahmed Nefzi, Hatem Samaali, Fehmi Najar</i>	An inerter-based active vibration isolation system <i>Neven Alujevic</i>	Cluster synchronization of dry friction oscillators <i>Andrzej Stefanski</i>

**Monday, 4<sup>th</sup> September 2017 (Cont.)**

16:40 – 17:00	Vibration-based damage detection of structure's joints in presence of uncertainty <b>Ali Abolfathi</b>	Accurate backbone curve for ultrathin NEMS with geometric imperfection <i>Marsha Parmar, <b>Najib Kacem</b>, Akshay Naik</i>	Modeling and investigation of a hybrid thermal energy harvester <b>Todor Todorov, Nikolay Nikolov, Georgi Todorov, Yanko Ralev</b>	State switching using PD-like control in multistable systems <b>Boying Liu</b>
17:00 – 17:10	<b>Break</b>			
<b>17:10</b>	<b>Hall Moussala 1</b> <b>MS 05. Dynamics of Composite and Smart Structures</b> Chair: Krzysztof Marynowski	<b>Hall Moussala 2</b> <b>MS 03. Modelling, Methodologies and Engineering Applications of Nonlinear Dynamical Systems</b> Chair: Ekaterina Pavlovskaja	<b>Hall Vihren</b> <b>MS 12. Nonlinear Effects in Broadband Energy Harvesting from Mechanical Vibrations</b> Chair: Americo Cunha	A vibro-impact capsule system with double-sided constraint <b>Yang Liu</b>
17:10 – 17:30	Vibration modes of a rotating three-composite-blades rotor, <b>J. Warminski, A. Teter, J. Latalski, A. Mitura, M. Bochenski, Z. Szmit, J. Gawryluk</b>	Soliton waves in damped, weakly coupled periodic nonlinear structures <i>Diala Bitar, <b>Najib Kacem</b>, Nouredine Bouhaddi</i>	Spherical magnetic pendulum system for energy harvesting <b>Grzegorz Litak, Daniil Yurchenko</b>	
17:30 – 17:50	Suppression of structure's roll motion using a tuned liquid damper <b>Takashi Ikeda, Yuji Harata, Ryo Nakamura</b>	Preparation of triboelectric nanogenerator via electrospinning and its potential applications as self-power force sensor, <b>Cristobal Garcia, I. Trendafilova, R. Guzman, J. Sánchez</b>	Energy harvesting from an oscillating vertical cantilever with clearance <i>Krystian Łygas, <b>Grzegorz Litak</b></i>	
17:50 – 18:10	Stability analysis of a rotating composite beam vibration under harmonic base motion <b>Jaroslaw Latalski, Jerzy Warminski</b>	Dynamic behaviour of rotors supported by fluid-film bearings operated close to fluid-induced instability <b>Luboš Smolík</b>	Nonlinear piezoelectric transducers for kinetic energy measurement and broadband energy harvesting <b>Carlo Trigona</b>	
18:10 – 18:30			Electromagnetic vibration energy harvesting for railway applications, <b>Sonia Bradai</b>	
19:00	<b>Welcome Reception</b>			

## Tuesday, 5<sup>th</sup> September 2017

09:00 – 09:50	<b>Plenary lecture: Tomasz Kapitaniak</b> (Lodz University of Technology, Poland), Transitions between different ringing schemes of the church bell <b>Chair: Jerzy Warminski</b>			
09:50 – 10:20	<b>Coffee Break</b>			
10:20	<b>Hall Moussala 1</b> <b>MS 05. Dynamics of Composite and Smart Structures</b> <b>Chair: Emil Manoach</b>	<b>Hall Moussala 2</b> <b>MS 01. Mitigation of Vibrations of Mechanical and Structural Systems</b> <b>Chairs: Daniil Yurchenko, Przemyslaw Perlikowski</b>	<b>Hall Vihren</b> <b>MS 11. Active Vibration Control</b> <b>Chair: Bram Cornelis</b>	<b>Hall Aleko</b> <b>MS 16. Vibration and Control in Downhole Drilling Processes</b> <b>Chair: Marian Wiercigroch</b>
10:20 – 10:40	Thermo-elastic vibrations of a circular composite plate <i><b>Anna Warminska, Emil Manoach, Jerzy Warminski</b></i>	Effects of play and inerter nonlinearities on the performance of tuned mass damper <i><b>Przemyslaw Perlikowski</b></i>	The development of approaches to creation of system of active vibration control in problems of the dynamics for granular media <i>Andrei Khomenko, Sergey Kargapol'tsev, <b>Andrey Eliseev</b></i>	Numerical and experimental studies of stick-slip oscillations in drill-strings <i><b>Yang Liu</b></i>
10:40 – 11:00	Vibration analysis of an axially moving multiscale composite plate subjected to thermal loading <i><b>Krzysztof Marynowski</b></i>	Experimental verification of damping properties of the novel tuned mass damper inerter device with variable inertance <i><b>Mateusz Lazarek, Piotr Brzeski, Przemysław Perlikowski</b></i>	Active vibration control of a flexible link robot with the use of piezoelectric actuators <i><b>Darren Williams, Hamed Haddad Khodaparast, Chenguang Yang</b></i>	Stick-slip and torsional friction factors in inclined wellbores <i>Ulf Jakob Arsnes, <b>Roman Shor</b></i>
11:00 – 11:20	Nonlinear dynamics of a planar hinged-supported beam with one end spring system <i><b>Łukasz Kłoda, Stefano Lenci, Jerzy Warmański</b></i>	The use of classical rolling pendulum bearings (CRPB) for vibration control of stay-cables <i><b>Georgia Papastergiou, Ioannis Raftoyiannis</b></i>	Dynamic characteristics of rotors on passive and active thrust fluid-film bearings with fixed pads <i><b>Alexander Babin, Leonid Savin, Sergey Majorov</b></i>	Small scale drilling test rig for investigation of axial excitation on the drilling process <i><b>Ian Forster</b></i>

**Tuesday, 5th September 2017 (Cont.)**

11:20 – 11:40	Synchronisation of three beam rotor driven by chaotic oscillator <b>Zofia Szmit, Jerzy Warminski</b>	Suppression by noise of self-excited vibrations <b>Roman Bobryk, Daniil Yurchenko</b>	Towards the simulation of direct field acoustic tests with mimo random control <b>Mariano Alvarez Blanco</b>	Active control of nonlinear drill-string torsional dynamics <b>Thiago Ritto, Maryam Ghandchi</b>
11:40 – 12:00		Tuned rail-damper: inherent property and effectiveness on railway vibration and noise reduction <b>Tianxing Wu</b>	Synthesis of control algorithms for robotic platform <b>Larisa Rybak, Elena Gaponenko, Dmitry Malyshev</b>	Helical buckling of drill-strings <b>Marcin Kapitaniak, Vahid Vaziri, Marian Wiercigroch</b>
12:00 – 12:20		Another look at pendulum tuned mass dampers <b>Daniil Yurchenko</b>		
12:20 – 12:40		Optimal design of power frames for special purpose vehicles' cockpits with regard to their eigenfrequencies and shock resistance <b>Aleksandr Leontev</b>		
12:00 – 14:00	<b>Lunch</b>			
14:00 – 14:50	<b>Plenary lecture: Marcelo Savi</b> (Federal University of Rio de Janeiro, Brazil) Nonlinear dynamics of smart bioinspired systems <b>Chair: Zuzana Dimitrovova</b>			
14:50 – 15:20	<b>Coffee Break</b>			

**Tuesday, 5th September 2017 (Cont.)**

15:20	<b>Hall Moussala 1</b> <b>MS 07. Vibrations of Beams, Plates and Shells, from Nano to Macro</b> <b>Chair: Pedro Ribeiro</b>	<b>Hall Moussala 2</b> <b>MS 08. Nonlinearity and Stochasticity in Vibrating Systems</b> <b>Chair: Przemyslaw Perlikowski</b>	<b>Hall Vihren</b> <b>MS 03. Modelling, Methodologies and Engineering Applications of Nonlinear Dynamical Systems</b> <b>Chair: Li-Qun Chen</b>	<b>Hall Aleko</b> <b>MS 13. New Trends in Analytical Approaches to Nonlinear Vibration</b> <b>Chair: Nicolae Herisanu</b>
15:20 – 15:40	Static and dynamic instability of pyramidal truss <b>Murillo Santana, Paulo Gonçalves, Ricardo da Mota Silveira, Peter Berke</b>	Sample-based approach in strongly non-linear multistable systems with uncertainties <b>Przemyslaw Perlikowski</b>	Escape bifurcations of a forced triple-well potential duffing oscillator with fuzzy uncertainty <b>Ling Hong</b>	Optimal homotopy asymptotic method to large post-buckling deformation of mems <b>Nicolae Herisanu</b>
15:40 – 16:00	Mode localization in a pair of weakly coupled nonlinear beams <b>Jacqueline Bridge, Kirish Balram</b>	The behavior of impacting systems under random forcings <b>Aasifa Rounak, Sayan Gupta</b>	A new autogenous mobile system driven by vibration without impacts <b>Du Van Nguyen, Tuan Ngoc La, Hung Ngoc Chu</b>	Nonlinear vibrations of a mechanism for the miller-atkinson cycle <b>Ionut Dragomir, Bogdan Manescu, Nicolae-Doru Stanescu</b>
16:00 – 16:20	Experimental and numerical investigation of eigenfrequencies of rectangular plates, interacting with a fluid <b>Sergey Lekomtsev, Sergey Bochkarev</b>	Stochastic modelling of earthquake slip distribution using multi-dimensional ensemble empirical mode decomposition technique <b>Sangeetha S., Raghukanth S.T.G.</b>	Identification of a Bouc-Wen model using an adaptive Volterra series <b>Rafael Oliveira Teloli</b>	Influences of the control on the nonlinear vibrations of a variable compression ratio mechanism <b>Bogdan Manescu, Ionut Dragomir, Nicolae-Doru Stanescu</b>
16:20 – 16:40	Sophisticated finite strips for modelling vibrations of a rotating tyre <b>Neven Alujevic</b>	Bifurcation analysis of an accelerating disc in a bounded compressible medium <b>W. Dheelibun Remigius, Sunetra Sarkar</b>	Dynamics of a piecewise linear oscillator with a play <b>Antonio Chong, Yuan Yue, Ekaterina Pavlovskaja, Marian Wiercigroch</b>	The nonlinear thermomechanical vibration of a functionally graded beam on Winkler-Pasternak foundation <b>Nicolae Herisanu</b>

**Tuesday, 5th September 2017 (Cont.)**

16:40 – 16:50	Break			
16:50	<b>Hall Moussala 1</b> <b>MS 07. Vibrations of Beams, Plates and Shells, from Nano to Macro</b> <b>Chair: Paulo Gonçalves</b>	<b>Hall Moussala 2</b> <b>MS 04. Vibration of Solids and Structures under Moving Loads: Modelling and Analysis</b> <b>Chair: Piotr Koziol</b>	<b>Hall Vihren</b> <b>MS 06. Nonlinear Dynamics of MEMS &amp; NEMS</b> <b>Chair: Najib Kacem</b>	<b>Hall Aleko</b> <b>MS 16. Vibration and Control in Downhole Drilling Processes</b> <b>Chair: Marcin Kapitaniak</b>
16:50 – 17:10	Non-local models for vibrations of graphene sheets <i>Tomás Chuaqui, Pedro Ribeiro</i>	Moving mass problem: complete solution with the effect of initial conditions <i>Zuzana Dimitrovova</i>	Numerical modeling of squeeze film damping in circular microplates <i>Aymen Jallouli, Najib Kacem, Fehmi Najar, Joseph Lardies</i>	Suppression of drill-string stick-slip vibration <i>Vahid Vaziri, Marcin Kapitaniak, Marian Wiercigroch</i>
17:10 – 17:30	Vibration of nano rods considering the lateral inertia effects in doublet mechanics <i>Ufuk Gul, Metin Aydogdu</i>	Online adaptive semi-active vibration damping of slender structures subject to moving loads <i>Andrzej Myslinski, Dominik Pisarski</i>	Mode localization capabilities in weakly coupled near-periodic oscillators for mass sensing applications <i>Claude Humbert, Thérèse Leblois, Vincent Walter, Najib Kacem</i>	FEM modelling of drill-bit and formation interactions <i>Nina Yari, Lifeng Ma, Marian Wiercigroch</i>
17:30 – 17:50	Size effects on free vibration of heterogeneous beams <i>Bahman Hassanati, Marcus Wheel</i>	The effects of the variations of bending and torsional rigidities on the modal characteristics of aircraft wings <i>Huijuan Su, Jnan Ranjan Banerjee</i>	Nonlinear analysis of a new parametric tunable resonance MEMS device using a shallow arched beam <i>Sarah Ben Sassi, Hassen Ouakad, Fehmi Najar</i>	Numerical application of a stick-slip control and experimental analysis using a test rig <i>Leonardo Dias Pereira, Bruno Cayres, Hans Ingo Weber</i>



**Tuesday, 5th September 2017 (Cont.)**

17:50 – 18:10	<p>Modes of vibration of beams in piezoelectric materials by a modified couple stress theory  <i>Batool Soleimani Roody, Hamed Akhavan, <b>Pedro Ribeiro</b>, Ali Reza Fotuhi</i></p>	<p>Analytical approximation of rail bending stress  <b>Piotr Koziol</b></p>	<p>Bifurcation topology tuning in imperfect circular microplates under electrostatic actuation  <b>Aymen Jallouli</b>, Najib Kacem, Joseph Lardies</p>	<p>Linear stability analysis of drill bit whirl with state-dependent delay  <b>Dapeng Zhao</b>, Marion Fourmeau , Pascal-Alexandre Kane</p>
18:10 – 18:30		<p>Moving element analysis of high-speed rail system accounting for hanging sleepers  <b>Jian Dai</b>, Kok Keng Ang</p>	<p>Dynamic behavior of a mass sensing MEMS device using electrostatic actuation and mode localization  <b>Vincent Walter</b>, Najib Kacem, Joseph Lardies</p>	

**Wednesday, 6<sup>th</sup> September 2017**

09:00 – 09:50	<b>Plenary Lecture: John Mottershead</b> (University of Liverpool, UK), Progress in Stochastic Model Updating <b>Chair: Emil Manoach</b>			
09:50 – 10:20	<b>Coffee Break</b>			
<b>10:20</b>	<b>Hall Moussala 1</b> <b>MS 16. Vibration and Control in Downhole Drilling Processes</b> <b>Chair: Vahid Vaziri</b>	<b>Hall Moussala 2</b> <b>MS 08. Nonlinearity and Stochasticity in Vibrating Systems</b> <b>Chair: Sayan Gupta</b>	<b>Hall Vihren</b> <b>MS 02. Nonlinear Oscillations and Controls of Mechanical, Civil, Aerospace and Naval Structures</b> <b>Chair: Elżbieta Jarzębowska</b>	<b>Hall Aleko</b> <b>MS 15. Wave Mechanics: Generation and Propagation of Waves in Fluids, Solids and Structures</b> <b>Chairs: Apostolos Tsouvalas, Darren Williams</b>
10:20 – 10:40	Finite element modelling of the dynamics of groovy ball bearings <b><i>Olamide Sherifah Ajala, Marian Wiercigroch</i></b>	Investigation of targeted energy transfer in stochastically excited system with nonlinear energy sink <b><i>Pankaj Kumar, S. Narayanan, Sayan Gupta</i></b>	Dynamics modeling and performance analysis of underwater vehicles based on the Boltzmann-Hamel equations approach <b><i>Elżbieta Maria Jarzębowska, Michał Cichowski</i></b>	Interaction acoustic waves with a layered structure containing layer of bubbly liquid <b><i>Damir Gubaidullin, Anatolii Nikiforov</i></b>
10:40 – 11:00	Dynamic analysis of a drillstring-riser system drilling in deep water <b><i>Maolin Liao</i></b>	Stochastic nonlinear analysis of drill-string torsional drill-string vibrations <b><i>Thiago Ritto, Daniel Castello, Daniel Lobo</i></b>	Estimation of energy-efficiency of oscillations of rotors on radial fluid-film bearings <b><i>Sergey Majorov, Leonid Savin, Alexander Babin</i></b>	A contactless acoustic levitation motor via autoresonance and modal excitation <b><i>Solomon Louis Davis, Izak Bucher, Ran Gabai</i></b>
11:00 – 11:20	Monitoring drilling conditions using the Hilbert-Huang transformation <b><i>Piotr Wolszczak, Grzegorz Litak</i></b>	Response statistics of nonlinear rotating shaft subject to biaxial random excitation <b><i>Arvid Naess, Oleg Gaidai, Michael Dimentberg</i></b>	Energy balance analysis in non-linear dynamic equivalent systems <b><i>Carlos Iturregui Arranz</i></b>	Controlling underwater acoustic wave with pentamode materials <b><i>Gengkai Hu</i></b>

**Wednesday, 6<sup>th</sup> 2017 (Cont.)**

11:20 – 11:40	Effect of rotary speed modulation on the stability of rotary drilling <b>Sunit Kumar Gupta</b> , Pankaj Wahi	Stochastic bifurcation analysis of an elastically mounted flapping airfoil in an inviscid fluid <i>Chandan Bose</i> , <b>Sunetra Sarkar</b> , Sayan Gupta	Exploiting nonlinearity in a flapping wing mechanism of a bio inspired micro air vehicle to enhance energy efficiency <b>Ali Abolfathi</b>	Reflection of acoustic waves from the boundary or layer of two-phase medium <i>Damir Gubaidullin</i> , <b>Dilya Gubaidullina</b> , Yurii Fedorov
11:40 – 12:00	Analysis of drillstring vibration based on signal processing <b>Dapeng Zhao</b> , Marion Fourmeau, Pascal-Alexandre Kane	Investigation on the effect of noise on a freely vibrating circular cylinder using time series analysis <i>Aswathy M. S.</i> , <b>Sunetra Sarkar</b>	Dynamic modeling, flight control design and uncertainty quantification of a balloon-hexacopter unmanned aerial vehicle <b>Davi Santos</b> , Americo Cunha Jr, Diego Colón	Tree root detection from ground surface vibration measurements <b>Michal Kalkowski</b> , Jen Muggleton, Emiliano Rustighi
12:00 – 12:30	<b>Hall Moussala</b> Vibrations in Rotating Machinery – <b>presentation of HBM Prencia</b>			
12:30 – 13:30	<b>Lunch</b>			
13:30 – 18:00	<b>Excursion</b>			
19:00 – 23:00	<b>Conference Dinner</b>			

## Thursday, 7<sup>th</sup> September 2017

09:00 – 09:50	<b>Plenary Lecture: Haiyan Hu</b> (Beijing Institute of Technology, China), Recent Advances in Flutter Analysis and Control of Aircraft <b>Chair: Caishan Liu</b>			
09:50 – 10:20	<b>Coffee Break</b>			
<b>10:20</b>	<b>Hall Moussala 1</b> <b>General Papers</b> <b>Chair: Jerzy Wojewoda</b>	<b>Hall Moussala 2</b> <b>MS 04. Vibration of Solids and Structures under Moving Loads: Modelling and Analysis</b> <b>Chair: Zuzana Dimitrovová</b>	<b>Hall Vihren</b> <b>MS 09. Vibrations in Mechanical and Biomechanical Systems</b> <b>Chair: Rafal Rusinek</b>	<b>Hall Aleko</b> <b>MS 15. Wave Mechanics: Generation and Propagation of Waves in Fluids, Solids and Structures</b> <b>Chair: Apostolos Tsouvalas</b>
10:20 – 10:40	Dynamics of nonlinear waves in the tubes filled with aerosol <b>Damir Gubaidullin, Rinat Zaripov, Liudmila Tkachenko</b>	An assessment of the mounting conditions on the vibro-acoustic response of a motor assembly based on subsystem modelling techniques <b>Roberto Faventi, Lin Ji, Danny Taylor</b>	Dynamic modelling of planetary gears: fixed and rotating frame of reference comparison <b>Kolade Abiola Olanipekun, Neil Ferguson, Emiliano Rustighi</b>	Plane waves and vibrations in the theory of elasticity for materials with a triple porosity structure <b>Merab Svanadze</b>
10:40 – 11:00	An interferometric radar sensor for monitoring the vibrations of structures at short ranges <b>Guido Luzi</b>	On the dynamics of ultrasonic actuators, coupled to near-field acoustically levitated objects – Reduced order modelling and experiments <b>Dotan Ilssar, Izhak Bucher</b>	A dynamic model of cylindrical plunge grinding process for chatter investigation <b>Paweł Lajmert, Małgorzata Sikora, Dariusz Ostrowski</b>	Plasticity detection and quantification in monopile support structures due to axial impact loading <b>Peter Meijers</b>
11:00 – 11:20	Mixed $H_2/H_\infty$ control of vibrational systems <b>Ivica Nakić</b>	The shaker parameters estimation, a first step to virtual shaker testing <b>Jonathan Martino</b>	Particular aspects regarding the effects of whole body vibration exposure <b>Mihaela Picu</b>	Interaction of the fundamental torsional guided wave with discontinuities <b>Yordan Mirchev, Mitko Mihovski</b>

### Thursday, 7<sup>th</sup> September 2017 (Cont.)

11:20 – 11:40	Experimental determination of rigid body properties: an evaluation on the use of piezoelectric or MEMS tri-axial accelerometers <i>António Urgueira, Nuno Venâncio, Pedro Riscado, <b>Tiago Silva</b>, Raquel Almeida,</i>	Dynamic responses of vehicle-ballasted track interaction system for heavy haul trains <i><b>Yingjie Wang</b>, Zuzana Dimitrovová, J.D. Yau</i>	Experimental and numerical studies of a single flexibly mounted rod in a triangular rod bundle in cross-flow <i>Normunds Jakobsons, Sergejs Dementjevs, <b>Sabine Upnere</b>, Filippo Barbagallo</i>	Axial Wave Reflection and Transmission in stepped nanorods using doublet mechanics theory <i>Metin Aydogdu, <b>Ufuk Gul</b></i>
11:40 – 12:00	Theoretical study on the dynamic response of pipe conveying gas-liquid flow <i><b>L. Enrique Ortiz-Vidal</b>, David Guillermo Castillo Neciosup, Quino Valverde Guzmán</i>	Comparison of 1d and 2d solution for a beam under transverse impact <i><b>Vitezslav Adamek</b></i>	Chatter identification in milling of Inconel 625 based on recurrence plot technique and Hilbert vibration decomposition <i><b>Pawel Lajmert</b>, Rafał Rusinek, Bogdan Kruszyński</i>	Reflection and transmission of acoustic waves through the layer of multifractional bubbly liquid <i><b>Damir Gubaidullin</b>, Ramil Gafiyatov</i>
12:00 – 12:20	Aeroelastic analysis of the launch vehicles using quasi-steady aerodynamics <i><b>Jae-Sung Bae</b></i>		Dynamics of SMA micro-actuator in biomechanical system <i><b>Rafał Rusinek</b>, Andrzej Weremczuk, Marcin Szymanski, Jerzy Warminski</i>	
12:30 – 12:45	<b>Closing Ceremony</b>			
12:45 – 14:00	<b>Lunch</b>			

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